Notes for CURSOR #9

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Ron Jeffries, Publisher

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CURSOR™

Programs for PET™ Computers

"Everything is deeply intertwingled."

Theodor H Nelson (Dream Machines)

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A CURSORY GLANCE

Commodore is shipping the model 2040 dual floppy disk system for the Pet. You should know my biases before I evaluate this new product: Cursor is a software publisher. We (currently) publish programs for only one personal computer - the Commodore Pet. Naturally, it is in our best interest for Commodore to thrive, for each new machine that they sell represents a potential new subscriber for us. As of April, 1979, there are only three personal computers that appeal to a mass market: Apple, Radio Shack and Pet. In certain respects, Commodore has better features than the other two, incuding a very nice screen editor, pretty graphics (although not in color), and a reasonable operating system and Basic. The small keyboard on the 8K Pet was probably a mistake, although not near as bad as some TRS-80 enthusiasts would lead you to believe. Back to disks: the TRS-80 has had disks available for months, while Pet owners were limited to cassette tapes. But a wonderful disk system was being designed and soon we were to benifit from the greater care that Commodore was taking in its design. For example, the TRS-80 disk holds about 90,000 characters on one diskette. Commodore stores about 170,000 characters on the same 5 inch diskette.

Based on a <u>few days</u> experience with the new Pet disk, I am not very impressed. (My first surprise was the price, which turned out to be close to $1300). According to an engineer friend of mine, the Shugart drives that Commodore is using have been stripped of several components (we assume that this was done to save money). Point A: there is no head-load solenoid. The effect is that when the door to the disk is closed, the head of the disk is always loaded. The motor that rotates the disk must overcome a fair amount of friction each time that the disk is activated. Point B: they do not have a microswitch that senses when the head is retracted to track zero. Instead, you will hear a nice grinding sound each time that you initialize the disk, as they run the stepper motor as far as it will go, and then time-out. Point C: They don't have a LED to sense the index hole in the diskette. What effect this will have on the reliability with which they are able to read disks remains to be seen.

Since we don't know all of the tradeoffs that they considered in their design, it is difficult to evaluate what effect these hardware decisions will have. But I can say something about how friendly the disk operating system is. Based on my limited experience with the Pet 2040 disk system, I think they screwed it up very effectively. I think I know why, too: when the Pet operating system was designed, they were in a big hurry to get it out the door, so that they could sell lots of machines. They didn't put any "hooks" into the main operating system for the disk system. After all, they had the IEEE-488 bus, right, and everyone assumed that their disk system problems were solved. Well, their disk box does hang on the 488 bus, and it does have a lot of smarts all its own. There are two microprocessors inside, (one of them is a 6502, just like in the Pet). The disk box has its own local RAM memory (which is nice, since the disk system doesn't use any of your precious memory in the Pet). But there are costs to the disk system being completely separate from the host computer. Worst example I can give: you have to write a short Basic program to find out what error you got when the disk system fouls up. In fact, the only way that you know that a disk error happened is to look at the error LED on the disk unit. There is no message on the screen! One last gripe: in order to look at the directory for a disk that you have put in the drive, you must type:

```
OPEN 1,8,15
PRINT#1,"I0"
LOAD "$0",8
LIST
```

What I like is how intuitive and natural that sequence is! And someone told me that the Pet was the first "appliance computer". Tell ya what: if toasters were that hard to use we'd all still be roasting bread on a stick over the open fire. On the other hand, why did I buy the bloody thing? Well, it speeds up my work a lot. As an example, the program "Gammon" in this issue loads in about seven seconds, and "Circle" loads in about four seconds. If the 2040 disk system proves to be reliable, Commodore will sell a lot of them. One last "gottcha": the new disk does NOT work with the old ROMs! Well, since they fixed a lot of problems with the new ROMs, that doesn't bother me, as long as they provide the new ROMs at a reasonable price. (Remember, your hardware had a warrenty, but the software i.e. ROMs did not!) There seems to be a small problem: the new ROMs will not be available until mid-July for the older Pets. (If you bought your pet before February of 1979, you have an old Pet.) Sigh!

CURSOR #9 HAS THESE PROGRAMS:	
COVER	A spiral pattern designed by Ken Matthews.
YAHTZEE	The game of Yahtzee for one to four players. By Glen Fisher.
SLOT!	The Cursor Casino, with sound! By Mark Heaney.
FLIP	A utility to help convert text in programs from old to new ROMs. By Glen Fisher.
CIRCLE	Great circle navigation: How far is it to... Based on program by Martin Mabee in CLOAD Magazine.
GAMMON	A 16K game of Backgammon - you against the Pet. By David Malmberg and Glen Fisher.

MORE ABOUT THE PROGRAMS

YAHTZEE... Another excellent game program from Glen Fisher. Up to four people can play the game, with all of the scores being displayed in an easy to read fashion. The game is very close to 8K, so the instructions are very short. When the game begins, you first enter the names of the players. To roll the dice on the first roll you press 'Return'. When you see what you rolled, you can selectively roll dice by typing the value of the dice you want to roll. For example, if you type '263', it will roll the dice that have that value showing. If you want to roll more than one of a given value, then type it as many times as you want dice rolled. Example: you first roll: 2 2 5 6 6. You decide to try and get all sixes, so you want to roll both twos and the five. Type: 225, then 'return'. You select which combination of dice you want to score by typing the appropriate letter that appears in front of that choice. If you had rolled 1 1 1 5 3, you might select aces, which is selected by typing 'A'. Sometimes you have to select something that gives you a zero score. To guard against an accident, the Pet will ask you 'Really zero it?' If you type 'Yes', then it will accept your request. (You can avoid this by typing a 'z' in front of your choice).

SLOTI... This is a simple program that is lots of fun. You should hook up your Pet for sound to get the full benifit. (Reminder: in any program that uses sound, if you use the stop key to interrupt the program while it is producing sound, you won't be able to save programs on cassette until you turn the Pet off, and then back on again).

FLIP... As you may know, Commodore has developed a new set of ROMs. One of the changes that they've made involves the way that upper and lower case is handled. With the old ROMs, when you POKE 59468,14 you are in upper and lower case mode, but the lower case letters are shifted (i.e. the opposite of a normal typewriter). With the new Pet ROMs, the opposite is true. The problem you may find is taking programs written for the old ROM convention and translating them for the new ROMs. Please note that there is not usually a simple solution, even with flip! To use Flip, first read it into the Pet and Run it, which stores it in the second cassette buffer. Then read in the program that you want to convert, and type SYS(826). Note that Flip is reversible, so that after you flip a program, the next time you type SYS(826) it will be flipped back to its original condition.

The toughest problem that you'll find is that it will still take some work to convert a program to the new ROMs, because Flip doesn't know whether a given part of the program is expecting graphics mode (POKE 59468,12) or upper and lower case mode. Ideally, flip would only operate on that text that is used with upper and lower case, but there isn't a practical way to do that. Instead, you'll need to experiment by flipping the program, running it and seeing which parts you don't want flipped. At this point you can flip it back, and use a trick: the flip program normally works only on PRINT, INPUT and DATA statements. So, for lines that you don't want flipped, just edit them so they start (temporarily) with the keyword REM. Now when you type SYS(826) and flip the case of the program, it will ignore those lines! One more thought: this program normally flips strings in quotes in DATA statements. If you want DATA left untouched, type: POKE 884,255 before you type SYS(826).

CIRCLE... We wanted to have as much data as possible in this program, yet still fit it into 8K. So, there are no directions within the program at all! However, it is an easy program to use, as you will see. There are two ways that you can use the program: you can tell it the country (or state) from which the trip begins, and it will search its built-in data bank for the information. For example, if you want to find the distance from Washington, D.C. to Los Angeles, California, when the program asks 'From where:' you would type the first letter of the state 'D'. It will then query you for each city that it knows about. Next, it will ask 'To where:', and you repeat the procedure. The second way of using the program is to press 'return' when it asks 'From where:'. When you do this, it assumes that you want to enter latitude and longitude in degrees, minutes (and seconds if you like). Degrees, minutes and seconds are separated by commas. For latitudes you'll need to also enter N or S for North or South, and for longitudes naturally you'll need to put in East or West. The Circle program was purchased from Martin Mabee who wrote the original version for the TRS-80 cassette magazine CLOAD. It was rewritten for the Pet by Glen Fisher. If your favorite country or city is missing, it is because we had to perform extensive surgery to make it fit into 8K. You can customize the program quite easily by adding or deleting data statements. (If you'd like to get a much more complete set of data, send a stamped, self addressed envelope to Cursor, and we'll send you a printed list of all the data that we have.)

GAMMON... Sorry folks: if you have an 8K Pet, this program will not work for you, since it needs about 14k! We realize that many people have 8K Pets, but from our mail, it also seems that a lot of our readers have expanded their Pets to 16K. Since there are many things that have to be severely 'stripped down' to fit in 8K, it seems reasonable that from time to time Cursor should publish some larger programs. Actually, we'd like to get feedback from you on this matter. To make life easy for us, please send a postcard, and express your opinion about 8K vs. larger programs in Cursor. Next month I'll report back to you with the results. (Please, no six page letters on this one. I'm already behind in answering the mail!)

Gammon is a great version of Backgammon that is co-authored by David Malmberg and our software editor Glen Fisher. It has excellent instructions, so we won't have to say much here. I will mention that before I reviewed this game, I had only played one or two games of Backgammon a few years ago. However, I find the computer version to be really interesting and fun. If you don't already know the game, don't be afraid to try and learn, as it is one of the most interesting that I have found. If you are a novice, there is a strange Backgammon term you'll see: a 'blot' is simply a single piece all by itself. The game is such that blots are not what you want to have on the board, as they are vulnerable to attack by your opponent.

HACKER HINTS: About those new ROMs...

You've heard quite a bit about the new ROMs from us, and there is a simple reason: it is causing us some pain! I'm sure that several of the other independent software publishers are experiencing the same problems that we are. Here is some background: when the software gurus at Commodore decided to fix all of the mistakes in the first set of ROMs, they evidently felt that there was little reason to maintain compatibility between the two versions. The main programs that are affected are those that use machine language, or that use features of the operating system (as opposed to pure Basic) in order to do fancy stuff.

Before we talk about some of the specifics, here is a proposal for conventions that will help everyone the next time around.

PROPOSED CONVENTIONS FOR ROM DEPENDENT CODE

Most ROM dependencies come with PEEKS and POKES. We propose that when these are done to either examine or modify operating system locations that some standard variable names be used. Then, to convert a program to new ROMs, all that must be changed is the value assigned to the variable. We will use the following variables, which all start with the letter "Q":

OLD	NEW	VARIABLE	DESCRIPTION
135	053	QM	End of memory. (Number of 256 byte pages: 32=8k, 64=16k, 128=32k).
525	158	QK	Number of characters in the keyboard queue
234	205	QQ	Quote mode flag
245	216	QL	Current line address of the cursor (Not to be confused with CURSOR!)
515	151	QP	Key code of the pressed key
516	152	QS	"1" means that SHIFT is pressed

Commodore published a memory map in their new manual, and have provided updates for the machines with new ROMs. (Oh yes, you know that you have the new ROMs if it says "### COMMODORE BASIC ###" instead of "*** COMMODORE BASIC ***") In the updates that we got, there were some errors and ommissions. Here are corrections: location 152 is shown as "unused". Not true: it contains a one when SHIFT is pressed. Location 216 is the line number of the cursor. In case you haven't seen this trick, you should know that you can have a vertical tab capability by POKEing a number from 1 to 25 in location 216, and then print a cursor-up character. The cursor will appear on that line of the screen. Here is an example of printing "RON" at line 3, column 10. Note that we use the TAB function to get to the column, and its argument is always the column desired minus one.

```
New ROM:  10 POKE 216,3: PRINT TAB(9);"[up]RON"
Old ROM:  10 POKE 245,3: PRINT TAB(9);"[up]RON"
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COMPUTER LIB and DREAM MACHINES

There is a classic book in the small computer field that many people haven't read. It is called Computer Lib and Dream Machines, and is actually two books. (You read Computer Lib for the first half, then flip the large 11" by 15" paperback over and continue reading a different book called Dream Machines.) As Computer Lib starts out, the author - Thodor Nelson states: "Any nitwit can understand computers, and many do". That sort of gives a hint of the tone of the book, which is irreverent (but whats to be reverent about?), outrageous and just plain fun. There is a lot of good, solid information here too, although the rather poor organization of the book sometimes makes it hard to read, and even harder to find a reference that you are looking for. Nelson is opposed to what he calls "Cybercrud", which he defines as "putting things over on people using computers". As you read the book, you may disagree with Ted from time to time, but it will be a dull soul indeed that won't get some enjoyment, and probably some fresh information as well from the book. He gives pretty good tutorials on three computer languages: Basic, TRAC (a registered service mark of Rockford Research, Inc.), and APL. Basic is almost a universal language now that cheap home computers are a reality. But TRAC is little known outside of a small band of devout worshipers. APL has the blessing of IBM, and hence a much large band of worshipers.

Dream Machines is an exciting look at the world of computer graphics, which is a specialty of Nelson. The book is worth the price just to read about the system that Nelson has designed called "Xandu". Basically, Xandu, if and when it becomes a real product, will be one of the nicer text handling systems that you can in your wildest dreams imagine. (I'm afraid, however, that Nelson may be much better at dreaming than he is at implementing! Xandu may never happen, which is too bad for all of us.)

The book is available from your local computer store, or you can write: The Distributors, 702 South Michigan, South Bend, IN 46618. The ISBN code is 0-89347-002-3. (Final note: since the book was published in 1974, and then slightly updated in 1975, a lot of water has passed under the bridge. Little things like TRS-80 and Pet and Apple and Atari and TI, etc. etc. So, the book is dated, but again, lots of what Nelson has to say will be as relevant in twenty years as it is now.)

HINTS and INFORMATION

We have worn off the symbols on the keyboards of two of the older 'small keyboard' Pets. Our local dealer ordered a set of replacement key tops for us, but we were a bit suprised when what arrived was only the small metal inserts for the tops of the keys. Here is our method of replacing the caps (it isn't very hard). First, take off the key you want to put a new cap on. I used a dull letter opener (dull from opening all the Cursor mail). The key will come off fairly easily. The biggest danger is that you will lose the small spring that is under the key. Next, take a single-edge razor (a small Xacto knife would also work), and carefully pry the metal cap off of the plastic keytop. Please note that the plastic keytop has a slot in it, and that if you aren't careful, you may glue the new metal cap in the wrong direction! After you get the old metal cap pried off, use rubber cement to glue the new one in place. (Since you may have to repeat this operation sometime in the future, it seems obvious that you don't want to use one of the new, powerful 'super' glues that will never release.) All that is left is for you to put the spring back in place, and then press the key back in place. If this all sounds very complicated, it shouldn't, since it is a fairly easy, although tedious process.

As you may know, a line in a Pet Basic program can be 80 characters long, or two lines on the screen. There is a fine point that may help you: the key is 'two lines on the Pet screen'. It is possible to enter legal lines that are longer, by using the token for PRINT, which is the question mark. However, these lines will then be very difficult to edit, since the screen editor expands the tokens to the word 'PRINT'. You have a choice: you can retype the line, or play tricks by changing the PRINT statements to question marks, just so you can do your editing!

To get somewhere on the Pet screen, we find that it is almost always easier to first do a 'Home', and then do cursor downs, than to use the cursor up key, which requires that you also press 'shift'. Note to future designers of machines with screen editing: a key that takes the cursor to the bottom left of the screen would be very handy.

Do you know about 'shift Return'? When you have botched a line, either in editing or entering, if you press 'shift', and keep it down when you press 'return', the changes will be ignored.

One of our subscribers has to move his Pets from place to place in his car frequently. He says that in many cases, if you have trouble with your Pet, you should first unplug it, and then take the four screws out that hold the top cover on. Next, firmly press each chip into its socket, and then close it up and see if things work.

SERIOUS USES OF SMALL COMPUTERS (Revisted)

A few issues back I sussested that many people were hoping to use these little machines for useful work, but that in fact, few actually are able to do so. This month I got the followins letter that I enjoyed very much. I think that some of us that were raised on IBM 370s may sometimes fail to realize that there are situations where a small, 'inadequate' computer is a hell of a lot better than no computer at all! (However, there are very real limits to what can be done with only 8k of memory. If you have an 8k Pet, my best advice is to purchase a memory expansion board as soon as possible.

Dear Mr. Jeffries,

Just recently subscribed to your "magazine" and am greatly impressed. According to you Issue #3, you are requesting that those who are using their "Pets" for serious application, write.

So, not knowing that I could not use my Pet for serious work in the nursing home, I managed (through trial and error as I am the rawest of novices) to do my payroll through my Pet. I merely input the number of hours worked for the particular employee (data material) and am given the correct salary with FICA deducted, correct taxes deducted (data also has if they are married or not, and the program includes the different tax brackets and the merried or single rate) deducts the state tax, employee fund, gives the total deductions and the gross amount of pay. PLUS totals all the above so I can give the information to my accountant for his records. If my printer ever gets in then maybe I can program it to write the checks also and the written report that I need to give my accountant. (By the way, there are over 60 employees!)

Needless to say, I am very proud of myself for doing this, as I really don't understand everything that I've been reading, but persistence and patience do count for something, and I'm glad I didn't know that I was doing the "impossible" cause then mayhap I wouldn't have tried!

I save over five hours computing my payroll every two weeks and figure on saving three more hours whenever the printer comes in!

Sincerely,

Donna Caubarreaux

DONNA CAUBARREAUX
ADMINISTRATOR